Review of 1981 Commercial Abalone Fishery in British Columbia

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Fisheries and Aquatic Sciences 1692

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by

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The 1981 commercial abalone fishery harvested 93,651 kg (206,470 lbs). Most of the catch was taken in Area 6 (40% of total B.C. catch), with lesser amounts in Area 2E (23%) and Area 12 (10%). Abalone fishing effort by Statistical Area varied widely and averaged 133 kg/diver day. This is similar to the level reported in 1980, but is down from the levels recorded during the period 1977 to 1979.

Key words: northern abalone, fishery, management regulations.

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Les pêcheurs commerciaux ont capturé 93 651 kg (206 470 lb) d'ormeaux en 1981. La plus grande partie des prises (40% du total en C.-B.) a été pêchée dans la zone 6 et de plus petites quantités ont éte recueillies dans les zones 2E (23%) et 12 (10%). L'effort de pêche par zone statistique varie beaucoup et la moyenne s'élève à 133 kg par jour de plongée. Ce taux, semblable à celui de 1980, est inférieur à ceux enregistrés de 1977 à 1979.

Mots-clés: ormeau, pêche, règlement de gestion.

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INTRODUCTION

This report reviews the 1981 abalone fishery in British Columbia and outlines management strategies, total catch, catch per area, and effort per vessel and day. The report also compares the present catches and fishing effort with earlier years. A previous report (Fedorenko and Sprout 1982) reviewed the abalone fishery from 1952 to 1980 and the present report is the second in a series of publications by the Department of Fisheries and Oceans (DFO) aimed at providing an annual summary of the abalone fishery.

SOURCE OF DATA

Data were obtained from fishermen's harvest logs (Append. 1) which must be filled out and submitted on a monthly basis or following the completion of each abalone trip. The harvest logs are considered to provide a more accurate estimate of total catch than published data from sales slips and for this reason some discrepancy is expected between catch data from this report and from the Fisheries Statistics, B.C., which relies only on the sales slip system. Because the logs are considered confidential, only general fishing locations rather than specific sites, will be discussed.

Landings are expressed in kilograms (kg), or occassionally in pounds (lb) for comparative purposes.

REGULATIONS

Each year the DFO representatives meet with abalone fishermen following the end of the season to review the past year's fishery and to discuss fishing plans for the upcoming season. Following this meeting fishing guidelines are issued to each licence holder which detail the allowable catch, season and other appropriate regulations (Append. 2).

In 1981, because of additional biological findings which indicated lower growth and mortality rates for abalone than previously thought, the allowable coast-wide catch was reduced from 113,398 kg (250,000 lbs) in 1980 to 90,718 kg (200,000 lbs) in 1981. As in the previous year, the allowable catch was distributed equally to each licence holder so that each abalone vessel was assigned 3628.7 kg (8000 lbs). The season began on April 15, 1981 and closed on December 31, 1981; procedures for reporting of catches are discussed in a later section.

Other major actions implemented for the 1981 fishery were as follows:

1. A subcommittee comprised of five licence holders was formed to recommend changes in abalone licence policy to the DFO and to advise on biological programs and activities.

2. In order to reduce catches in Area 6 (Fig.1), which has been intensively harvested in the last few years, adjacent locations previously closed to commercial fishing were reopened to encourage a wider distribution of the fishing effort (Apped. 3).

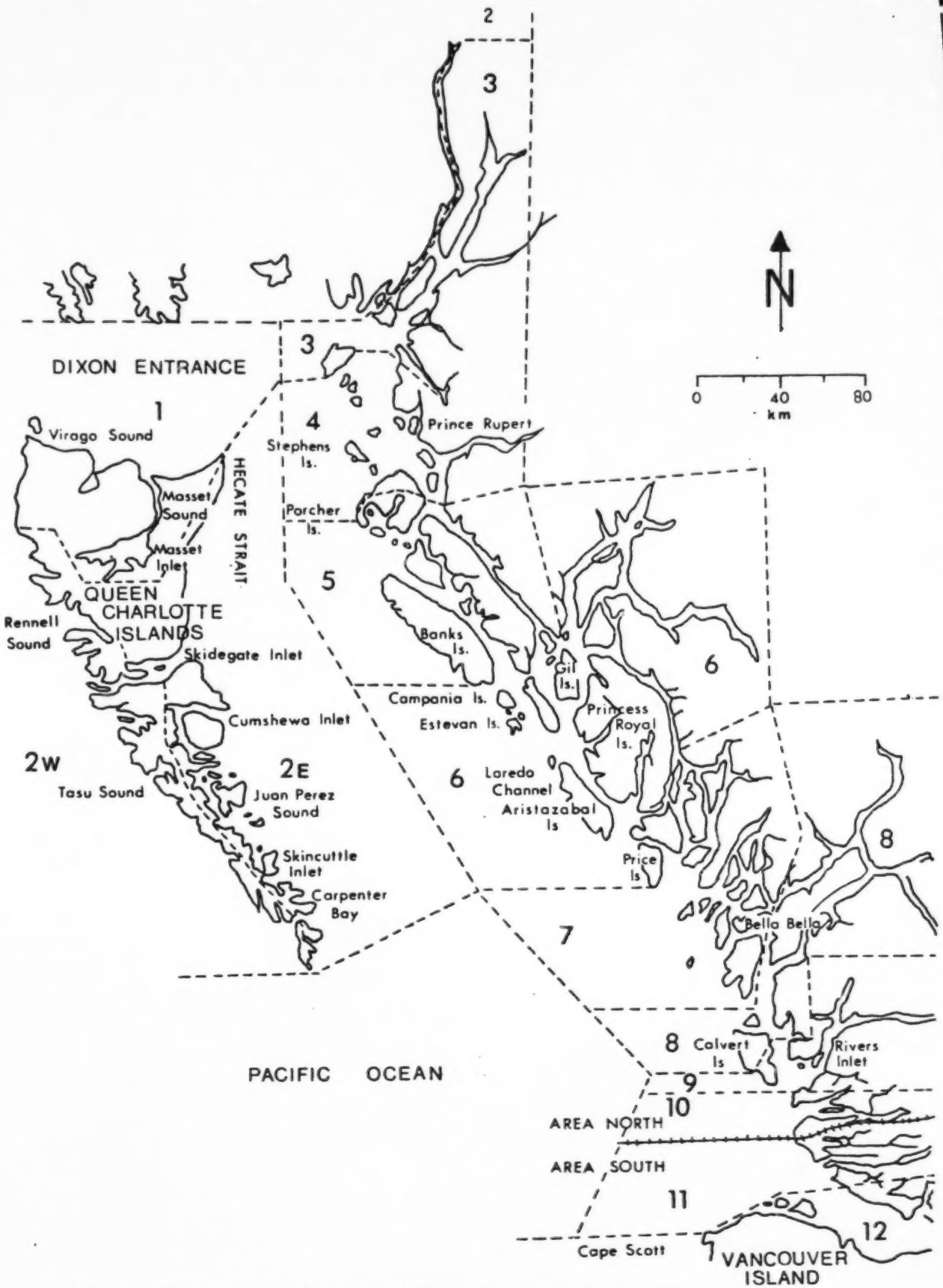

Fig. 1. Location of Statistical Areas in northern B.C.

3. In 1981, fishermen delivering frozen abalone which were glazed (i.e. frozen abalone to which a thin layer of ice is added) were permitted to deduct 7% of the total weight of the abalone to arrive at a net weight. The net weight was the weight assigned to the licence holder's quota. Thus the maximum allowable quota per licence holder, if delivering glazed abalone was 3883 kg.

This action was implemented for two reasons: (1) to ensure that same glaze allowance was applied to all catches instead of the previous system in which different allowances were permitted and different methods were used to calculate the allowances; and (2) to encourage fishermen to apply an adequate glaze and thereby ensure product quality and reduce the likelihood of bacterial contamination.

LICENCING

The limited entry of 26 vessels and the $200.00 licence fee were continued, and as in previous years the licence was issued to the individual and the licence holder had to be the registered owner of the designated fishing vessel. Although personal abalone licences continued to be non-transferable, licence holders were allowed to transfer their licences to other vessels in cases where they were the vessel owner. By following this procedure it was possible to fish one abalone licence and then to transfer another licence to the same vessel. In this manner, one vessel could fish two licences. A minimum abalone catch was unnecessary to be eligible for licence renewal in 1981 and there was no restriction on the number of divers, but each had to have a valid personal commercial fishing licence.

Prior to fishing, each abalone licence holder had to advise the appropriate District Officer, and all abalone catches had to be inspected by a Fishery Officer prior to unloading and their catches validated prior to leaving for the next trip. Again, as in past years, log sheets accompanied by maps showing exact harvest locations, had to be filled daily and, after completion of the trip, forwarded to the Management Biologist coordinating the fishery. Sales slips had to be submitted for all abalone harvested.

COMMERCIAL ABALONE CLOSURES

Commercial abalone closures were implemented in a number of areas along the B.C. coast since 1971. Generally, closures were made in order to conserve overharvested or low productivity areas, and to preserve traditional native food fishery areas and important recreational sites. Areas closed, reasons for closures and implementation dates are given in Table 1.

In 1981, except for the reopening of certain locations in Area 6, the closed areas did not change from the previous year. (Boundaries of closed areas are specified in Appendix 4).

Table 1. Commercial abalone area closures, dates implemented and reasons for closures, B.C., 1981.[a]

	Area[b]	Date Closure Implemented	Comments
Area 1	Masset Inlet Masset Sound McIntyre Bay	1977	-recreational harvest -native harvest
Area 1	Virago Sound	1978	-low stock levels -recreational harvest -native harvest
Area 2E	Juan Perez Sound	1973	-traditional native harvest -recreational harvest, in conjunction with Hotspring Island.
Area 2E	Cumshewa Inlet	1977	-low levels of old individuals; few juveniles and sub-legals; possibility of"recruitment" overfishing
Area 2E	Skincuttle Inlet Carpenter Bay	1979	-low stock levels
Area 2W	Rennell Sound	1977	-recreational harvest;one of two areas in Area 2W that is accessible by road from east coast
Area 2W	Skidegate Channel	1977	-traditional native harvest -recreational harvest;same as Rennell Sound
Area 2W	Tasu Sound	1977	-recreational harvest -surveys in this area by D F O in June, 1981, have indicated very low abundance of legal-sized abalone; this area has been closed to recreational harvesting since 1980.
Areas 4 and 5	Parts of Porcher Island, North end Banks Island	1977	-native harvest (Kitkatla Band) -recreational harvest
Areas 4 and 5	Stephens Island, Banks Island closure extended southward	1980	-native harvest (Kitkatla Band) -recreational harvest

Table 1 (cont'd).

	Area[b]	Date Closure Implemented	Comments
Area 6	Campania Island, Gil Island, Laredo Channel	1977	-native harvest (Klemtu, Bella Bella Bands) -recreational harvest -concern by Fishery Officers that recreational divers are overfishing the resource -closure was modified in 1981 and will be evaluated at end of season
Area 6	Portions of Campania Island reopened	1981	-see Appendix 3
Area 7	inside Price Island, Swindle Island Princess Royal Island, Don Peninsula	1977	-native harvest (Klemtu, Bella Bella Bands)
Area 8	North end of Calvert Island	1977	-low stock abundance (Fishery Officer estimates)
Area 9 and 10	Rivers & Smith Inlets	1978	-low stock abundance
Area 12 to 19	Lower Johnstone Strait Strait of Giorgia, Strait of Juan de Fuca	1971	-low stock abundance -recreation harvest thought to meet or exceed what stocks can sustain already
Area 21	Southwest Coast of Vancouver Island	1978	-concern by Fishery Officers for low stock abundance
Area 23 & 24	Barkley Sound & Clayoquot Sound	1978	-these areas were fished heavily during 1970-73; stocks have not recovered sufficiently to permit reopening.
Area 26	Kyuguot Sound	1980	-conservation; concern by Fishery Officers for low stock abundance.

[a] For Area boundaries see Appendix 4.

[b] See Figures 1 & 2 for area location.

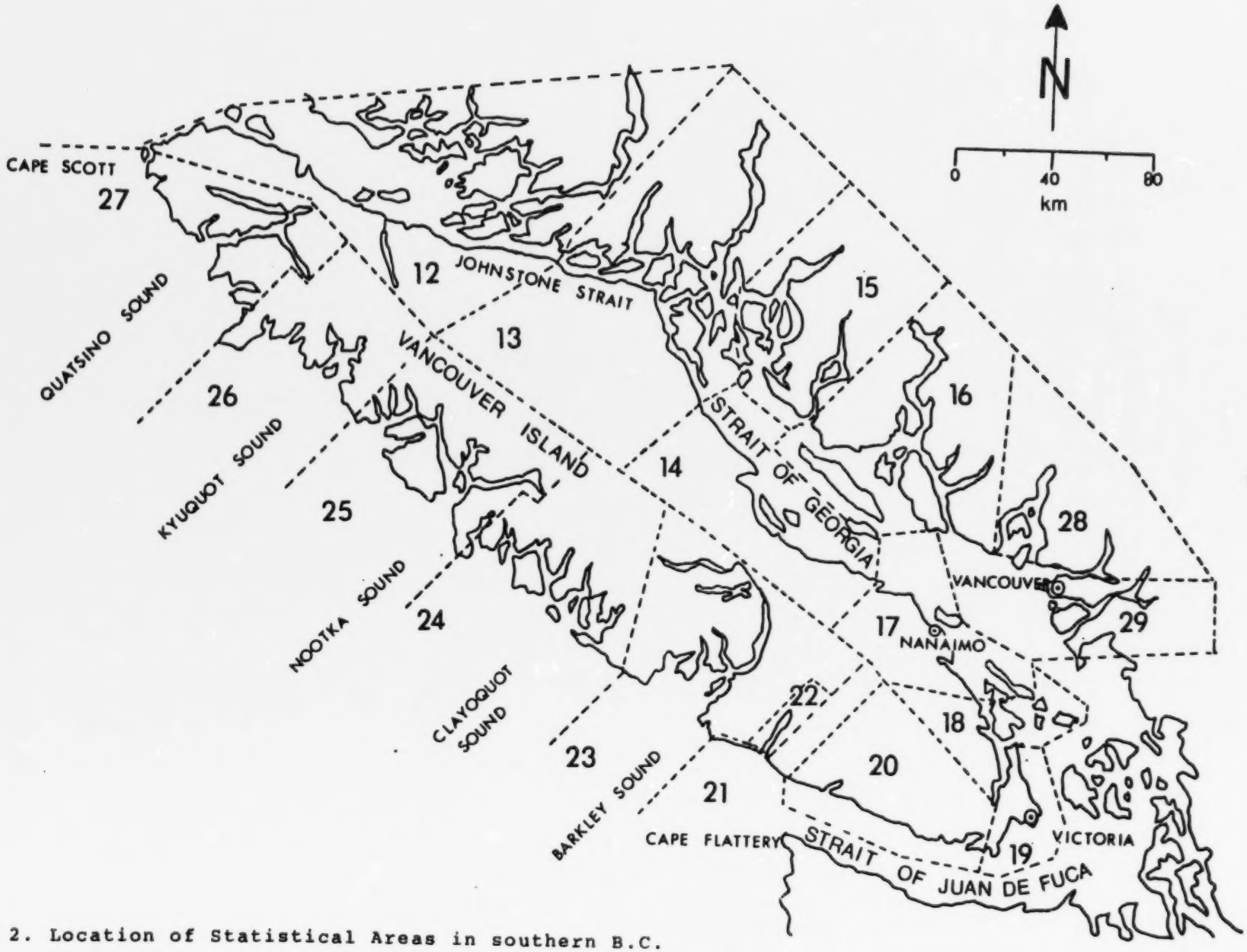

Fig. 2. Location of Statistical Areas in southern B.C.

DISTRIBUTION OF ANNUAL LANDINGS BY AREA AND VESSEL

In 1981, a total of 93,651 kg (206,470 lbs) of abalone were harvested in B.C. This compares with the high of 481,373 kg)1,061,250 lbs) landed in 1977 and the average of 63,327 kg (139,612 lbs) reported landed during the period 1952 to 1980 (Table 2). Most of the catch was taken in Area 6 (40% of the total B.C. catch), with lesser amounts in Area 2E (23%) and Area 12 (10%) (Table 3, Fig.3). The remaining 23% of the catch were taken in small amounts from Areas 1, 2W, 4, 5, 7, 9, 12 and 20 (Table 3, Fig.3). The 1981 catch distribution by Statistical Area was similar to recent years (Append. 5) but in 1981 there was an increase in catches from the Queen Charlotte Islands and this was accompanied by a decline in catches from the northern mainland and Johnstone Strait areas.

Abalone landings by Statistical Area (Fig. 1 & 2, Table 3) are discussed below:

Area 1
This area supported 2% of the B.C. catch (1,923 kg) with harvesting confined to Langara Island.

Area 2E
This area supported an important fishery with 21,321 kg (23% of total) landed; catches were reported from Kunghit Island north to Louise Island.

Area 2W
A total of 6,047 kg or 6% of the B.C. catch were harvested from Area 2W with catches reported from Louscoone Inlet and Gordon and Kunghit Islands. Smaller catches were reported from Flamingo Inlet and Anthony Island.

Area 4
Landings of 5,186 kg (6% of total) were reported from this area with catches from Melville and Porcher Islands.

Area 5
This area accounted for 3% (2,860 kg) of the total catch with catches reported from Grief Point, Spearer Point and Calamity Bay.

Area 6
This area supported the major fishery in 1981. Landings totaled 37,755 kg (40% of total) and catches were reported throughout the area including the Estevan Group, the lower westside of Aristazabel Island and Price Island.

Area 7
A small catch of 1,788 kg (2% of total) was reported for this area with harvesting confined to the Spider Group.

Area 9
A total of 553 kg (1% of total) were harvested from southern end of Calvert Island.

Table 2. Total annual landings of abalone in B.C., 1952-1981.

Year	Landings (kg)	Landings (lb)
1952	5,398	11,900
1953	10,342	22,800
1954	6,849	15,100
1955	3,583	7,800
1956	499	1,100
1957	953	2,100
1958	5,307	11,700
1959	181	400
1960	1,542	3,400
1961	9,389	20,700
1962	17,463	38,500
1963	5,715	12,600
1964	57,062	125,800
1965	3,084	6,800
1966	726	1,600
1967	862	1,900
1968	91	200
1969	635	1,400
1970	16,239	35,800
1971	6,441	14,200
1972	59,602	131,400
1973	67,131	148,000
1974	26,308	58,000
1975	56,699	125,000
1976	273,061	602,000
1977	481,373	1,061,250
1978	404,212	891,138
1979	208,169	458,937
1980	107,619	237,260
1981	93,651	206,470
Total	1,930,141	4,255,255

Table 3. Abalone landings by Statistical Area, B.C. 1981.

Area	Catch (kg)	% of Total
1	1923	2
2W	6047	6
2E	21321	23
Queen Charlotte Islands Total	29291	31
4	5186	6
5	2860	3
North Coast Total	8046	9
6	37755	40
7	1778	2
9	553	1
Central Coast Total	40086	43
11	1828	2
12	9595	10
20	4805	5
South Coast Total	16228	17
TOTAL	93651	100

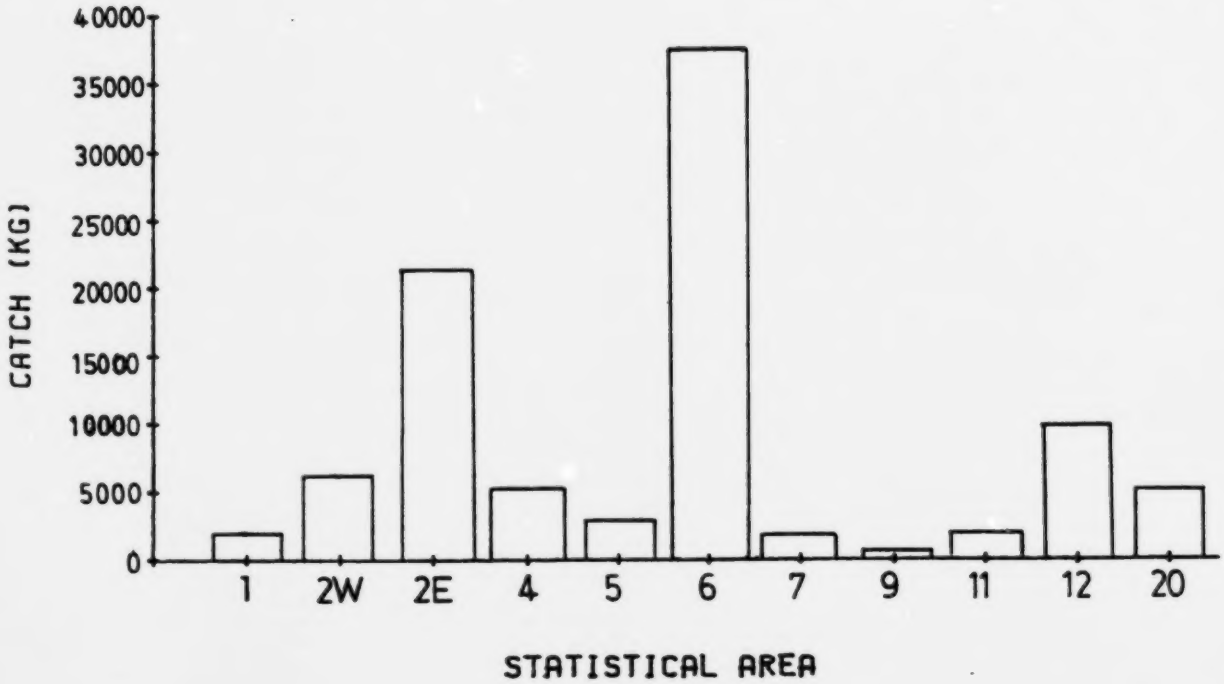

Fig. 3. Abalone catch by Statistical Area, B.C., 1981.

Area 11

This area accounted for 1,828 kg (2% of total) with catches divided between Allison Harbour and the Southgate Group.

Area 12

This area supported the major fishery in the south coast and 9,595 kg (10% of total) were reported from several locations, including Hope Island, the Miller Group, the Deserters Group and Single Tree Point.

Area 20

The catch from this area increased substantially from last year and 4,805 kg (5% of total) were landed with catches mainly from Sooke Harbour.

In 1981, landings were reported for all 26 licences and, with the exception of one licence, all landed over 3,249 kg (Table 4). By taking advantage of the glaze allowance, 15 licences (58% of total) reported landings between 3,636 kg and 3,883 kg which was the maximum allowable catch on landings of frozen glaze abalone (Table 4).

Although all licences reported landings in 1981, only 24 vessels actually harvested abalone. This was due to the fact that two vessels, each originally assigned one abalone licence, were allowed to transfer a second licence to the same vessel; thus, two abalone quotas were harvested by the one vessel.

FISHING EFFORT BY AREA AND VESSEL

Fishing effort by Statistical Area is shown in Figure 4 and Table 5. The total number of diver days continued to decline in 1981 to 702 days, down from the peak level of 2,387 days in 1977. Ranges in catch per effort (CPUE), defined as the number of kg of abalone landed per diver day, varied substantially between areas, but in the high production areas such as Area 6 and 12 showed little change from 1980. However, in Area 2E, also a high yielding area, CPUE decline was accompanied by an increase in fishing effort from 48 diver days in 1980 to 126 diver days in 1981.

Abalone fishing effort by vessel is shown in Table 6. CPUE varied widely between vessels and ranged from a high of 325 kg/diver day per vessel to a low of 67 kg/diver day per vessel. This is similar to the ranges recorded in previous years (Table 6).

Table 4. Range in abalone landings per licence holder, B.C., 1981.

Landings kg (lbs x 1000)	No. licence holders	% of Licence holders
0 - 907 (0-2)	0	0
907 - 1814 (2-4)	1	4
1814 - 2722 (4-6)	0	0
2722 - 3175 (6-7)	0	0
3175 - 3629 (7-8)	10	38
3629 - 3883 (8-8.56)[a]	15	58
TOTAL	26	100

[a] Maximum allowable catch which included glaze allowance on frozen abalone.

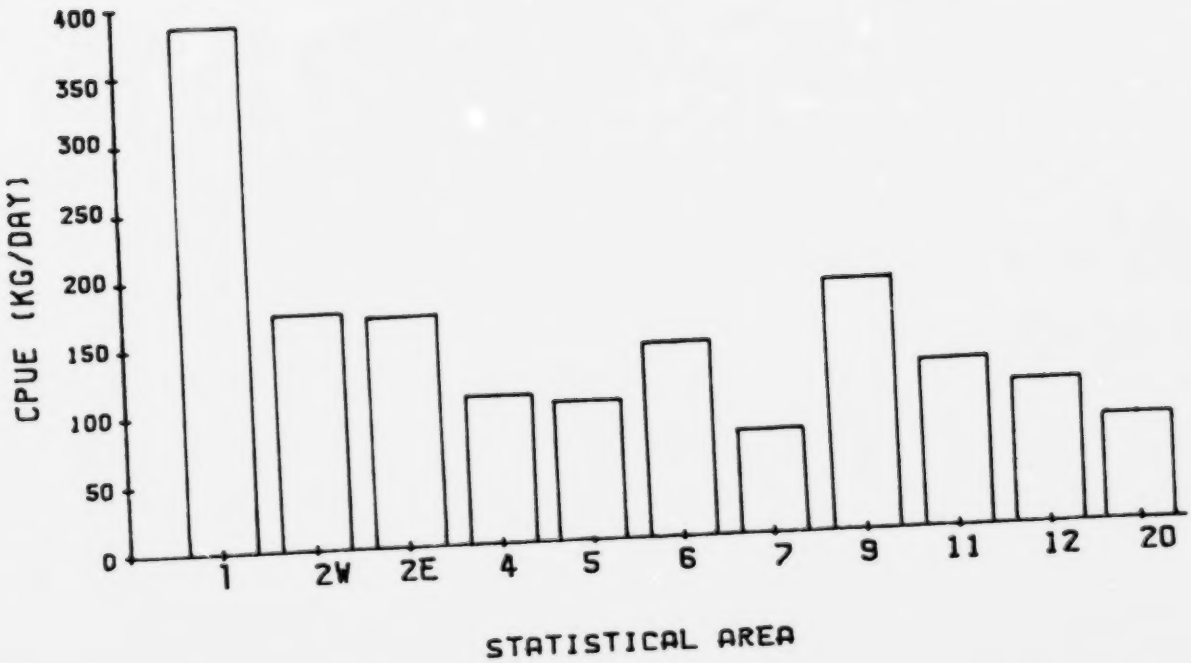

Fig.4. Abalone fishing effort by Statistical Area, B.C., 1981.

Table 5. Abalone fishing effort by Statistical Area, B.C., 1977-1981.

Statistical Area	1977		1978		1979		1980		1981	
	Total Diver Days	CPUE/ diver day(kg)	Total Diver Days	CPUE/ diver day(kg)	Total Diver Days	CPUE/ diver day(kg)	Total Diver Days	CPUE/ diver day(kg)	Total Diver Days	CPUE/ diver day(kg)
1	211	215.5	59	217.8	20	130.7	21	152.2	5	384.6
2W	75	180.8	80	182.5	63	162.0	21	177.4	35	172.8
2E	1,111	233.6	547	185.1	134	185.6	48	261.2	126	169.2
3	51	199.6	5	50.7	-	-	14	153.1	-	-
4	-	-	30	212.9	40	73.2	16	168.2	47	110.3
5	470	199.6	506	174.6	347	116.6	104	108.7	28	102.1
6	251	131.6	761	210.7	449	197.3	381	129.0	264	143.0
7	51	109.8	101	108.1	86	134.1	32+[b]	133.7	24	74.1
8	-	-	-	-	-	-	2	122.5	-	-
9	-	-	-	-	-	-	6	49.9	3	184.3
11	11	78.3	-	-	42	132.1	6	106.3	15	121.9
12	95	89.9	6	76.4	126	137.4	130+[b]	106.8	92	104.3
19	-	-	10	91.2	17	82.8	7	149.6	-	-
20	16	89.4	23	91.9	4	70.3	12	79.7	63	76.3
24	4	44.9	-	-	-	-	-	-	-	-
25	16	284.6	34	168.1	4	110.1	-	-	-	-
26	14	166.6	-	-	3	69.6	-	-	-	-
27	11	214.6	-	-	13	135.1	-	-	-	-
Total	2,387	-	2,162	-	1,348	-	800+10.5	-	702	-
Mean[a]	-	201.7	-	187.0	-	154.4	-	132.8[b]	-	133.4

[a]Total catch/Area+Total diver days.

[b]1,389 kg of unknown fishing effort; CPUE based on remaining catch.

Table 6. Mean annual abalone catch per vessel and fishing effort (No.diver days and catch/diver day), B.C., 1977-1981.

Year		No. vessels fishing	Total catch (kg)	Mean catch per vessel[a] (kg)	No. Diver Days			Catch/diver day (kg)		
					Total	Mean per vessel[b]	Range per vessel	Overall mean[c]	Range per Statistical Area	Range per vessel
1977		22	481,373	21,881	2,389	109	3-327	202	45-285	72-340
1978		25	404,212	16,168	2,162	86	8-204	187	51-218	49-354
1979	open	21	108,664	5,174	653	31	8- 54	166	-	49-585
	quota	24	99,505	4,146	695	29	16- 48	143	-	62-282
	total	25	208,169	8,327	1,348	54	-	154	70-197	-
1980		25[d]	107,619	4,305	810.5	32	13-73	133	50-261	70-349
1981		24[e]	93,651	3,902	702	29	12-58	133	74-385	67-325

[a] Total catch ÷ Total Vessels.

[b] Total diver days ÷ Total vessels.

[c] Total catch ÷ Total diver days.

[d] One additional licenced vessel burned.

[e] Two licences were transferred to other licenced vessels.

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REFERENCES

Fedorenko, A.Y. and P.E. Sprout. 1982. Abalone biology, fishery regulations, commercial catch (1952-1980), and current state of resource in British Columbia. Can. MS Rep. Fish. Aquat. Sci. 1658: 74p.

Appendix 1: Harvest log submitted by commercial abalone diver, B.C.,1981.

Operator:_____
Licence No._____
Vessel:_____

Return to: Dept. of Fisheries and Oceans
202-417 2nd Avenue West
Prince Rupert, B.C.
V8J 1G8

MONTHLY ABALONE REPORT SHEET

Date	Stat. Area	Harvesting Location	Diver_____ Diver Hrs. lbs. harvested	Diver_____ Diver Hrs. lbs. harvested	Diver_____ Diver hrs. lbs. harvested	Total Catch

NOTES: (i) Report sheets must be submitted on approximately a monthly basis, but can be submitted to coincide with trips.
(ii) Sketch maps must accompany reports showing exact locations harvested.
(iii) Reports will be confidential.

Appendix 2. Guidelines for the 1981 B.C. abalone fishery.

The guidelines for the 1981 abalone fishery are summarized as follows. In 1981, the allowable abalone catch will be 200,000 pounds and we anticipate a further reduction in allowable catch in 1982.

1. Licencing requirements for the 1981 abalone fishery

Limited entry will continue for this fishery. In 1981 the fishing vessel will be licenced. The licence fee is $ 200.00 and must be renewed by May 31, 1981. It will be necessary for the 1981 licence holder to be the registered owner of the designated vessel. Licences will not be transferable in 1981. The diving tender skiff is considered part of the mother vessel's fishing equipment and will not be licenced when engaged in the abalone fishery. Licence holders must carry a certification sheet on the vessel while fishing and the certification sheet must be validated by a Fishery Officer prior to each trip.

2. Renewal of licences for 1982

It will not be necessary to land a minimum abalone catch in the 1981 fishery to be eligible for renewal of an abalone licence in 1982.

3. 1981 abalone season and vessel quotas

The 1981 abalone fishery will begin on April 15, 1981 and close on December 31, 1981. The total allowable catch of 200,000 pounds will be divided equally among the licence holders and a quota of 8,000 pounds will be assigned to each licenced vessel. There will be no restrictions on the number of divers in this fishery.

4. Glaze allowance

In 1981 a fixed glaze allowance of 7% will be applied on all frozen glazed abalone loads. For each load of frozen glazed abalone, licence holders will be permitted to deduct 7% of this weight to arrive at an actual or recorded weight (ie. weight of abalone minus water). This information should be specified on the certification sheet and on the abalone log sheets.

NOTE: This does not apply to fresh abalone or to abalone which are frozen but do not have a glaze. The glaze allowance of 7% will be applied for all glazed abalone loads in 1981 and no exceptions will be made for loads which may be more heavily glazed. The allowable glaze will be reviewed at the end of the season.

5. Operation procedures in the 1981 fishery

a) Each abalone licence holder must inform the appropriate District Office prior to fishing in the area.

District (areas included)	Telephone
Queen Charlotte City (1,2)	559-4413
Prince Rupert (3, 4, 5)	624-9137
Kitimat (6, 7, 8, 9, 10)	632-6158
Port Alberni (21 -27)	724-0195
Campbell River (11, 12, 13)	287-2102
Victoria (20)	388-3252

b) All abalone vessels will require inspection by a Fishery Officer prior to unloading after each trip.

c) Licences must be validated by a Fishery Officer prior to the start of each trip.

d) Log sheets, accompanied by maps showing exact locations of abalone harvested, must be kept on a daily basis and available upon request by a Fishery Officer. These logs and maps must be submitted to the Rupert office on a monthly basis or to coincide with each trip.

e) Sales slips must be submitted for all abalone harvested.

Enclosed please find a list of closed areas, harvest sheets and maps for northern areas (for those areas which maps have not been provided, please draw your own, tracing off charts).

Failure to comply with these licence requirements will result in a recommendation to the Minister that the abalone licence be suspended or cancelled.

Appendix 3. Area 6 commercial abalone closure, B.C.,1981.

Inside (eastern) closure implemented in 1977.

Inside a line commencing at the Blackfly Point on Gil Island in a straight line to Block Head on Farrant Island, thence along the southerly shore of Farrant Island to Blossom Point, thence in a straight line to Mollison Point on Pitt Island, thence along the southerly shore of Pitt Island to Fleishman Point, thence in a straight line to Harlan Point on Campania Island, thence in a straight line to Humphries Point on Lotbiniere Island, thence in a straight line to Oswald Point on Rennison Island to the eastern extremity of Rennison Island, thence in a straight line to Ulrich Point on Aristazabal Island, thence along the easterly shore of Aristazabal Island to Lombard Point, thence in a straight line projected easterly to a white fishing boundary sign placed on the northwesterly shore of Price Island, thence along the westerly and northerly shores of Price Island to a white fishing boundary sign marking the boundary between Salmon Purse Seine Area Six and Salmon Purse Seine Area Seven, thence along the Salmon Purse Seine Area Six--Salmon Purse Seine Area Seven boundary to Split Head on Swindle Island, thence in a straight line to Errigal Point on Princess Royal Island, thence along the southerly shore of Princess Royal Island to Hartnell Point, thence in a straight line to the most southerly extremity of Hastings Island, thence along the easterly shore of Hastings Island to Hilbert Point, thence in a straight line across Laredo Inlet to Waser Point on Princess Royal Island, thence following sinuosities of the westerly shore of Princess Royal Island to Nelly Point, thence in a straight line to Maple Point on Gil Island, thence along the northerly shore of Gil Island to Blackfly Point, the point of origin.

The closure above was ammended in 1981 to exclude Squally Channel. The underlined part above was changed to: Inside a line commencing at Blackfly Point on Gil Island thence following the westerly side of Gil Island to Fawcett Point, thence in a straight line to Dogan Point on Campania Island, thence following the easterly shore of Campania Island to the southerly extremity of Campania Island.

Appendix 4. Commercial abalone area closures B.C.,1981.

THE FOLLOWING AREAS ARE CLOSED BY REGULATION IN THE "PACIFIC SHELLFISH REGULATIONS" OR BY PUBLIC NOTICE AS DESIGNATED ON LEFT HAND SIDE OF THE PAGE.

Areas 1, 2E and 2W

Regulations- 1) the waters of Juan Perez Sound and adjacent waters inside a straight line from Werner Point on Moresby Island to Ramsay Point on Ramsay Island, thence along the northerly shoreline of Ramsay Island to Andrew Point, thence in a straight line to Tuft Island, thence in a straight line to Fuller Point on Lyell Island, thence along the southerly shoreline of Lyell Island to Richardson Point, thence a straight line to Darwin Point on Moresby Island and thence south along the shoreline of Moresby Island to the point of commencement (Werner Point).

Regulations- 2) the waters of Rennell Sound inside a straight line from Cone Head to Clonard Point.

Regulations- 3) the waters of Skidegate Channel and adjacent areas (Dawson Inlet, Dawson Harbour, Trounce Inlet), inside a straight line from Ells Point on Graham Island to Teenakun Point on Chaatl Island, thence easterly along the north shoreline of Chaatl Island to Exact Point, thence in a straight line to Demariscous Point on Moresby Island, thence easterly along the north shoreline of Moresby Island to McLellan Point (East Narrows), thence a straight line true north to Graham Island, thence along the south shoreline of Graham Island to the point of commencement (Ellis Point).

Regulations- 4) the waters of Tasu Sound and adjacent areas inside a straight line from Davidson Point to Tasu Head.

Regulations- 5) the waters of Masset Inlet, Masset Sound and McIntyre Bay inside a straight line from Wiah Point to Skonun Point.

Appendix 4 (cont'd).

Public Notice 6) the waters of Cumshewa Inlet inside a line from Cumshewa Head to Skedans Point, and including waters of Carmichael Passage and Selwyn Inlet bounded on the south by a line from Selwyn Point Light on Moresby Island to a boundary sign opposite on Talunkwan Island, and on the east by a line from Nelson Point to Louise Island to Heming Head on Talunkwan Island.

Public Notice 7) the waters of Virago Sound inside a straight line true north from Inskip Point to point of interception with a straight line from Cape Naden to Cape Edensaw hence westerly along the line between Cape Naden and Cape Edensaw to Cape Naden.

Public Notice 8) the waters of Skincuttle Inlet and Carpenter Bay inside a line from Scudder Point on Burnaby Island to Benjamin Point on Moresby Island and in the north by a line running tre east from Dolomite Point on Moresby Island to a point on Burnaby Island.

Area 4

Regulations 1) all waters inside a line commencing at Hunt Point on Porcher Island, thence in a straight line to the most easterly point of Lucy Island, thence in a straight line to Triple Island, thence in a straight line to Butterworth Rocks, thence in a straight line to Seal Rocks, thence in a straight line to Welcome Point on Porcher Island, thence along the northwesterly shore of Porcher Island to Hunt Point on Porcher Island.

Area 5

Regulations & Public Notice 1) those waters inside a line commencing at a white fishing boundary sign on Cape George on Porcher Island and following a southern shore of Porcher Island to Sparrowhawk Point, thence in a straight line in a direction approximately 155 degrees true to the northwest corner of McCauley Island, thence following the northwest shore of McCauley Island to the light on Keswar Point, thence in a straight line in a direction approximately due south to an orange fishing boundary sign to the southeast of the entrance to Keyarko Cove on Banks Island, thence following the easterly and northerly shores of Banks Island to the light at the entrance to Larsen Harbour, thence in a straight line true south to Banks Island, thence following the westerly shoreline of Banks Island to Kelp Point, thence in a straight line true west to the surfline, thence following the surfline northerly to Bonilla Island light, thence following the surfline northerly to a point bearing Cape George true east, thence in a straight line true east to Cape George.

Appendix 4 (cont'd).

Area 6

Regulations 1) inside a line commencing at Blackfly Point on Gil Island thence following the westerly side of Gil Island to Fawcett Point, thence in a straight line to Dogan Point on Campania Island, thence following the easterly shore of Campania Island to the southerly extremity of Campania Island, thence in a straight line to Oswald Point on Rennison Island to the eastern extremity of Rennison Island, thence in a straight line to Ulrich Point on Aristazabal Island, thence along the easterly shore of Aristazabal Island to Lombard Point, thence in a straight line projected easterly to a white fishing boundary sign placed on the northwesterly shore of Price Island, thence along the westerly and northerly shores of Price Island to a white fishing boundary sign marking the boundary between Salmon Purse Seine Area Six and Salmon Purse Seine Area Seven, thence along the Salmon Purse Seine Six-- Salmon Purse Seine Area Seven boundary to Split Head on Swindle Island, thence in a straight line to Errigal Point on Princess Royal Island, thence along the southerly shore of Princess Royal Island to Hartnell Point, thence in a straight line to the most southerly extremity of Hasting Island, thence along the easterly shore of Hasting Island to Hilbert Point, thence in a straight line across Laredo Inlet to Waser Point on Princess Royal Island, thence following sinuosities of the westerly shore of Princess Royal Island to Nelly Point, thence in a straight line to Maple Point on Gil Island, thence along the northerly shore of Gil Island to Blackfly Point, the point of origin.

Area 7

Regulations 1) bounded on the north by a straight line true east from Jorkins Point on Swindle Island to Dowager Island opposite, and bounded on the south by a line true west from Keith Point on Dowager Island to Price Island opposite.

Regulations 2) bounded on the west from Promise Point on Cecilia Island along the westerly shore of Cecilia Island to Rankin Point, thence by a straight line to Providence Rock near Cape Mark; and bounded on the south by a straight line to the most northerly point on Limit Island thence by a straight line to Fingal Point on Princess Alice Island; and bounded on the east by a straight line to Bush Point on Don Peninsula; and bounded on the north from Bush Point on Don Peninsula along the southwesterly shore of Don Peninsula to Schubert Point, thence by a straight line to Promise Point on Cecilia Island opposite.

Appendix 4 (cont'd).

Area 8

Regulations 1) bounded on the north from Bayly Point on Nalu Island along the southeasterly shore to the most southerly point of Stirling Island, thence by a line true west to the surfline; bounded on the east by a straight line from Bayly Point on Nalu Island to Kelpie Point on Hecate Island, thence along the easterly shore of Hecate Island to Experiment Point, thence by a straight line to Wedgborough Point on Calvert Island; bounded on the south from Wedgborough Point on Calvert Island along the northerly shore of Calvert Island to a point due south of Surf Island, thence by a straight line to Surf Island, thence by line true west to the surfline.

Areas 9 and 10

Regulations 1) in the water of Salmon Purse Seine Areas 9 and 10 as described the aforementioned regulations.

Southern B.C.

Regulations 1) "all waters of Johnstone Strait, Stait of Georgia, Strait of Juan de Fuca, or any bay, inlet or other tidal water tributary thereto in the area bounded on the north by a line drawn from Neville Point to the westerly entrance to Port Neville Inlet to Hickey Point Light on Vancouver Island and bounded on the south by a line drawn from Williams Head through Race Rocks due south magnetic to the International Boundary."

Public Notice 2) all of Salmon Purse Seine Areas 21,22,23,24 and 26.

Appendix 5a. Annual abalone landings (kg) by Statistical Area 1-10, northern B.C., 1952-1981.[a]

Year	Statistical Area									
	1	2W	2E	3	4	5	6	7	8	9
1952	-[b]	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-
1955	-	-	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-	-	-
1957	-	-	-	-(+ 91 kg from unknown Area)				-	-	-
1958	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	181	-	-	-	-
1960	-	-	-	-	-	1,497	-	-	-	-
1961	227	-	-	-	2,132	363	3,357	-	-	-
1962	862	1,860	6,486	-	3,901	4,309	-	-	-	-
1963	998	-	408	-	1,134	1,179	-	-	-	-
1964	4,672	2,540	12,655	-	-	-	8,845	318	-	-
1965	-	-	1,588	-	-	-	-	-	-	-
1966	-	-	-	-	-	-	-	-	-	-
1967	-	-	-	-	45	-	-	-	-	-
1968	-	-	-	-	-	-	-	-	-	-
1969	-	-	-	-	-	-	-	-	-	-
1970	-	-	-	-	-	45	-	5,307	-	-
1971	-	-	-	-	-	-	-	-	-	-
1972	-	-	-	-	-	-	-	-	-	-
1973	-	1,814	5,443	-	4,082	16,783	454	-	-	-
1974	-	-	-	-	-	5,897	6,350	-	-	-
1975	-	-	2,268	-	2,268	9,525	16,329	14,061	-	<228
1976	4,536	-	112,037	-	4,989	88,450	37,194	1,814	-	907
1977	45,476	13,563	259,463	10,185	-	93,796	33,027	5,601	-	-
1978	12,847	14,602	101,257	254	6,388	88,358	160,380	10,922	-	-
1979	2,613	10,208	24,874	-	2,927	40,478	88,582	11,533	-	-
1980	3,196	3,724	12,537	2,143	2,692	11,309	49,160	5,166	245	299
1981	1,923	6,047	21,321	-	5,186	2,860	37,755	1,778	-	553

[a]From sales slip records (1952-1977); from log-book records (1978-1981).

[b]No landings recorded.

Appendix 5b. Annual abalone landings (kg) by Statistical Area 11-27, southern, B.C., 1952-1981.[a]

Year	Statistical Area														
	11	12	13	15	17	18	19	20	21	22	23	24	25	26	27
1952	-[b]	5,398	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	10,342	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	6,849	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	-	3,538	-	-	-	-	-	-	-	-	-	-	-	-	-
1956	-	499	-	-	-	-	-	-	-	-	-	-	-	-	-
1957	-	862	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	5,216	-	-	91	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	45	-	-	-	-	-	-	-	-	-	-	-	-
1961	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1962	-	45	-	-	-	-	-	-	-	-	3,311	-	-	-	-
1963	-	1,996	-	-	-	-	-	-	-	-	<227	-	-	-	-
1964	-	26,580	590	862	-	-	-	-	-	-	-	-	-	-	-
1965	-	1,497	-	-	-	-	-	-	-	-	-	-	-	-	-
1966	-	726	-	-	-	-	-	-	-	-	-	-	-	-	-
1967	-	816	-	-	-	-	-	-	-	-	-	-	-	-	-
1968	-	91	-	-	-	-	-	-	-	-	-	-	-	-	-
1969	-	227	-	-	-	-	-	-	-	-	-	-	-	-	-
1970	-	-	-	-	-	1,588	1,134	1,769	-	680	4,899	408	-	-	-
1971	-	<227	-	-	-	-	-	-	-	272	6,169	816	-	-	-
1972	-	6,577	45	-	3,311	3,175	953	408	-	-	40,007	-	5,080	45	-
1973	-	-	-	-	-	1,814	1,361	5,897	-	<227	8,618	20,865	-	-	-
1974	-	2,268	-	-	-	-	<227	7,257	<227	-	1,814	2,268	454	-	-
1975	-	3,175	-	-	-	-	-	3,629	-	-	907	-	<227	3,629	907
1976	-	5,443	-	-	<227	-	1,361	9,525	<227	-	1,361	2,268	<227	-	3,175
1977	861	8,545	-	-	-	-	-	1,430	-	-	-	180	4,554	2,332	2,361
1978	-	459	-	-	-	-	912	2,115	-	-	-	-	5,718	-	-
1979	5,548	17,312	-	-	-	-	1,408	281	-	-	-	-	440	209	1,756
1980	638	14,504	-	-	-	-	1,047	957	-	-	-	-	-	-	-
1981	1,828	9,595	-	-	-	-	-	4,805	-	-	-	-	-	-	-

[a,b] As for Append. 5a.